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## OUR VANISHING LICHEN FLORA

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Lichens are perhaps the least studied of any considerable group of plants. For convenience they may still be regarded as a group, although they are really a heterogenous assemblage that should be distributed among the fungi. Most writers of general texts on botany dismiss lichens with a few casual remarks replete with misinformation and inaccuracies. It has been said that lichens are the most difficult group of plants, but this is a gross overstatement. One has but to contemplate some of the fungi, Leguminosae (*sensu lato*), Compositae, Orchidaceae, or other large assemblages, to recognize that there are plenty of puzzles among plants other than lichens.

Yet despite the real or apparent difficulties of lichen study, and the vast distance of California, in early days, from centers of study or research, the lichen flora of the state long ago attracted the attention of European and New England botanists. No other part of our country has such a large number of endemic lichens notable for size, unusual thalline development, or other peculiarities which force them upon our attention. Then, too, a number of European species occur in California, although not in the regions east of the Sierra Nevada. Menzies, Bolander, and other keen observers supplied Tuckerman with specimens which the latter described. Later, Dr. H. E. Hasse and the writer made large collections of the lichens peculiar to California. When I left California in 1912 it was still possible, with one or two exceptions, to collect endemic lichens in their type localities.

What is the condition to-day? The regions where Bolander gathered amazing forms in abundance have long since been devastated by "real estaters," while it is now absolutely impossible to collect lichens in the favorite haunts of Dr. Hasse and myself, where hitherto unknown species were brought to light every year, or species new to North America were constantly being discovered.

In most regions throughout the world the press of population and the growth of factories merely "cramps the style" of lichens, and they are still able to maintain themselves in decency if not in luxury. But how is it in California? Consider conditions to-day in localities such as the Santa Monica hills, the coast of Southern California, Catalina Island, the plains, foothills, and mountains of the Santa Cruz Peninsula, the cliffs of Point Lobos, the cypresses and crags of the Seventeen Mile Drive, the Oakland Hills, Sutro Heights, Cliff House, and Twin Peaks at San Francisco. Miles of terrain are covered with asphalt, concrete and houses. Cliffs are obliterated entirely, or their faces have not only been "lifted" but removed so that they stand fifty feet or more further back than formerly. Their resident lichens have been not merely discouraged, they have been wiped out of existence. Those who remember the Cliff House in 1900 will know what I mean.

The Monterey cypresses with their extraordinary coats of luxuriant endemic lichens have been shut off from the public by converting the Seventeen Mile Drive into a real estate subdivision. The old fences, covered with a most extraordinary and luxuriant assemblage of rare lichens, whether at Alviso or the crest of the mountains, have been replaced by barbed wire. The county road back of Stanford University, with its high, shaded bank covered with rare lichens, has been replaced by a wide paved highway, and the banks where Dr. Peirce and I gathered rare plants are totally gone—used to fill some gully. I have searched in vain for many earth lichens once found along every foothill and mountain road in the Santa Cruz Peninsula. Useless was my search for the lichens endemic to the rock ledges crowning the Oakland and Berkeley hills. Where it is not all streets and houses, misguided zealots have made the countryside resemble a city playground, as far as lay within their power. It is perhaps worse in the vicinity of Santa Monica and Los Angeles where Dr. Hasse spent so many years.

I therefore urge that before it is too late, the botanists of California collect ample material of all lichens available. The coast north of San Francisco and the coast between the Monterey Peninsula and Santa Barbara should still shelter most of our rare and curious maritime lichens. Here and there one may see a few staggering panels of some crazy fence of redwood paling erected fifty to seventy-five years ago, while along the coastal

roads old board fences are occasionally seen. Every such bit of fence should be scrutinized and its lichens collected. Apparently our state is gradually becoming dryer; deforestation, the greater demand for water, and the capture of water that once fed springs and brooks, all combine to help make life more difficult for earth lichens. As the rainy season approaches, the collection of lichens becomes easier. Every botanist should make an effort during the coming winter to collect typical examples of all the lichens he sees. If this is not done soon, many of our lichens of greatest interest will exist only in one or two European and in two or three American herbaria.

I have not said anything of the fundamental importance of lichens as soil makers, nor of their being just as valuable as any other plants in the study of ecology. One could give many sound reasons for their collection and study, but at this time I merely urge that all botanists do what they can to get first-class specimens illustrative of some of our most unique plants, for the benefit of posterity.

Stanford University,  
September, 1935.

## STUDIES IN PENSTEMON—II. THE SECTION HESPEROTHAMNUS

DAVID D. KECK

The first revisional work in *Penstemon* by the present writer was published in 1932.<sup>1</sup> Many notes and a little manuscript were compiled thereafter in the expectation that these monographic studies in the genus would continue. Unforeseen developments caused my attention to be turned to other taxonomic problems but the opportunity has been sought to resume work in this genus when time permitted. The opportunity came in the winter of 1935 to study material of *Penstemon* in several important herbaria.

This, the second paper of the *Penstemon* series,<sup>2</sup> treats the shrubby Pacific Coast species of the section *Hesperothamnus*, which is proposed here as new. The results are largely the outcome of herbarium studies, although six of the eight species treated have been studied in the field and five of them have been grown for several years in the gardens of the Carnegie Institution of Washington at Stanford University.

All the material in the following herbaria has been examined:  
A—Arnold Arboretum, Harvard University, Jamaica Plain, Mass.

<sup>1</sup> Studies in *Penstemon*. A systematic treatment of the section *Sacantha*, Univ. Calif. Publ. Bot. 16: 367-426. 1932.

<sup>2</sup> A part of the cost of publication of this article is borne by the Carnegie Institution of Washington.—Ed.